JOINT CHEMICAL AGENT DETECTOR (JCAD)

The Joint Chemical Agent Detector (JCAD) is a pocket-sized device that is intended to automatically detect, identify, quantify, and warn users of the presence of nerve, blister, and blood chemical agents. JCAD will be mounted on a vehicle, tripod, aircraft, or ship, or fastened to the operator's load bearing equipment. The system is intended to be capable of being operated as a stand-alone detector; as part of a small local network of other JCAD units; or interface with the Joint Warning and Reporting Network (JWARN), as part of a larger network of biological and chemical detectors.

JCAD's hardware consists of the main Detector Unit (DU); a pre-concentrator accessory for extending the lower detection limit of the DU; and an interface cradle that includes a mount and connections to interface the DU with external power, external alarms, and other DUs to form a local detection network. One detector configuration is planned for use by all of the Services. JCAD will replace or augment existing Service-unique chemical agent detectors.

BACKGROUND INFORMATION

A combined Milestone I/II decision was made in December 1997 that allowed JCAD to enter into Engineering and Manufacturing Development (EMD). Phase I of the EMD contract was awarded in February 1998, and the Phase II contact option was exercised in April 1999. JCAD was placed under DOT&E oversight in January 2000.

The Air Force is JCAD's lead materiel developer, while the Army is the lead developmental and operational evaluator.

The Program Director of the U.S. Air Force Human Systems Program Office approved the Milestone I/II TEMP on September 10, 1997.

During the period January-March 2000, the government conducted Phase I Engineering Design Testing (EDT) of a brass board hardware and software prototype JCAD. The purpose of this testing was to provide an early assessment of the critical detection, identification, and quantification sub-systems prior to critical design review. This testing, which involved challenging the device with actual chemical agents, chemical agent simulants, and common battlefield interferents, was specifically designed to reduce the government's risk prior to finalizing the design of the device.

TEST & EVALUATION ACTIVITY

The program has breached its acquisition program baseline due to cost, schedule, and performance problems. The TEMP is under revision to reflect these baseline changes.

Live agent testing of an improved Phase II prototype was conducted at Dugway Proving Ground during the summer and fall of 2001. This testing was designed to demonstrate that the Phase II prototype meets all of the chemical agent detection, classification, and quantification requirements of the performance specifications. The results of this test are not yet available.

TEST & EVALUATION ASSESSMENT

Although limited in scope, the results of the engineering development test indicated that the Phase I JCAD prototype was not ready to proceed beyond the critical design review. The Phase I prototype baseline technology demonstrated the capability to detect only seven out of the required ten chemical agents. The sensor algorithm required significant improvement to reliably detect chemical agents at the concentration levels specified in the JCAD Joint Operational Requirements Document (JORD). In addition, the device needed to display an enhanced capability to reject false positive alarms.

Results of the Dugway live agent testing of the Phase II prototype will be reviewed during a special design review in early CY02.